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Claims as pending

CLAIMS:

1. An individually or substantial individually molded member for use as a railroad tie, lumber or other structural member, comprising a mixture of:
- from about 25% to about 55% of a thermoplastic polymer;
  - from about 4% to about 55% of a rubbery polymeric component; and
  - from about 4% to about 55% of a reinforcing filler.
2. A process for forming a molded member for use as a railroad tie, lumber or other structural member, comprising the steps of:
- mixing materials comprising,
    - from about 25% to about 55% of a thermoplastic polymer;
    - from about 4% to about 55% of a rubbery polymeric component; and
    - from about 4% to about 55% of a reinforcing filler;
  - injecting or extruding said mixture into a mold having at least one side, said mixture at least partially filling said mold, such that said mixture has at least one side surface and an interior portion;
  - cooling said mixture whereby said at least one side surface is at least partially hardened, thereby at least partially forming a member;
  - removing said member from said mold before said interior portion of said mixture is substantially hardened;
  - placing said member within or about a cooling apparatus; and
  - rotating said member about said cooling apparatus whereby said interior is at least substantially hardened.
3. The method of Claim 2 wherein said thermoplastic polymer is comprised of at least one of the materials selected from the group of materials consisting essentially of recycled polyolefins, recycled bucket resin, recycled drum resin, densified film, recycled grocery bags, electric wire coating, and recycled bottle resin or any combination thereof.

4. The method of Claim 2 wherein said rubbery component is comprised of at least one of the materials selected from the group of materials consisting essentially of crumb rubber, automotive fluff, tire belt fluff, carpet backing, rubber backing and recycled circuit boards or any combination thereof.

5. The method of Claim 2 wherein said reinforcing filler is comprised of at least one of the materials selected from the group of materials consisting essentially of carbon black, fly ash, mica, fiberglass, aragonite, crushed concrete, sand and crushed glass or any combination thereof.

6. The method of Claim 2 wherein said materials each comprise from about 25% to 55% of said mixture.

7. The method of claim 2 wherein said thermoplastic polymer and rubbery components comprise at least 20% of said mixture.

8. The method of claim 2 where in said mixture is heated by frictional and/or compressive heating of said mixer.

9. The method of Claim 2 wherein said mixture is at least partially heated by an external heat source.

10. The method of Claim 9 wherein said mixture is heated to about 380 degrees to about 440 degrees.

11. The method of Claim 8 wherein said mixture is preferably heated to about 400 degrees to about 420 degrees.

12. (Cancelled)

13. A process for forming a molded member for use as a railroad tie, lumber or

other structural member, comprising the steps of:

mixing portions from about 25% to about 55% of a thermoplastic polymer,  
with from about 4% to about 55% of a rubbery polymeric component;  
with from about 4% to about 55% of a reinforcing filler until said  
portions form a flowable mixture; and  
feeding said mixture into a mold having at least one side wall, said mixture at  
least partially filling said mold, such that said mixture has at least one side surface and an  
interior portion.

14. A polymeric composite for usage in molding applications comprising:  
a thermoplastic polymer component comprising recycled polyolefin, recycled  
copolymers thereof or combinations thereof and comprising about 25% to about 55% of said  
composite;

a recycled rubbery polymeric component comprising about 4% to about 55%  
of said composite;

a recycled reinforcing filler component comprising about 4% to about 55% of  
said composite; and

a foaming agent comprising less than 1% of said composite.

15. A molded member for use as a railroad tie, lumber or other structural member,  
comprising:

a mixture of

from about 25% to about 55% of a thermoplastic polymer;

from about 4% to about 55% of a rubbery polymeric component;

from about 4% to about 55% of a reinforcing filler; and

wherein said member is rotated at least once during cooling.

16. A process for forming a member having a plurality of surfaces, for use as a  
railroad tie, lumber or other structural member, comprising the steps of:

mixing,

about 25% to about 55% of a thermoplastic polymer;

about 4% to about 55% of a rubbery polymeric component;  
about 4% to about 55% of a reinforcing filler;  
injecting said mixture into a mold having at least one wall, wherein said mixture at least partially fills said mold about said wall, such that said mixture has at least one side surface along said wall and an interior portion;  
cooling said mixture whereby said at least one surface is at least partially hardened thereby at least partially forming a member;  
removing said member from said mold before said interior portion is substantially hardened;  
placing said member about a cooling apparatus  
rotating said member about said cooling apparatus whereby said interior is at least substantially hardened; and  
texturing at least one surface of said member.

BI 17. A process for forming a member having a plurality of surfaces and at least one textured surface, for use as a railroad tie, lumber or other structural member, comprising the steps of:

preparing a mixture of:

about 25% to about 55% of a thermoplastic polymer,  
about 4% to about 55% of a rubbery polymeric component;  
about 4% to about 55% of a reinforcing filler;  
forming a member by molding; and  
texturing at least one surface of said member.

18-28. (Cancelled)

29. The process of Claim 13, further comprising the step of using a Banbury mixer or other open chamber mixer to mix said mixture.

30. The process of Claim 13, further comprising the step of using a valve to feed said mixture into said mold.

31. The process of Claim 29, further comprising the step of using an extruder between said Banbury mixer or other open chamber mixer and said valve to transport said mixture to said valve.

32. The process of Claim 13, further comprising the step of using a plurality of molds to form a plurality of members.

33. The process of Claim 31, further comprising the step of adjustably controlling a density of said extrudable material.

34. The process of Claim 33, wherein at least one brake and/or at least one gear is used to control said density.

35. The process of Claim 13, further comprising the step of using a plurality of molds and filling at least one mold at a time.

B1 36. The ~~apparatus~~ process of Claim 35, further comprising the step of using a first diverter station and a second diverter station to fill at least one mold at a time.

37. The process of Claim 13, further comprising the step of cooling said mixture whereby said at least one side surface is at least partially hardened thereby at least partially forming a member.

38. The process of Claim 13, further comprising the step of closing the mold after it is filled.

39. The process of Claim 38, further comprising the step of placing the closed mold in a waterbath during cooling.

40. The process of Claim 39, further comprising the step of:  
removing said member from said mold before said interior portion is hardened.

41. The process of Claim 40, further comprising the steps of:  
placing said member within or about a cooling apparatus; and  
rotating said member about said cooling apparatus until said interior of said member is at least substantially hardened and/or cooled.

42. The process of Claim 41, further comprising the step of: texturing at least one surface of said member.

43. The member of Claim 15, wherein said rotation prevents said member from warping during cooling.

44. The member of Claim 15, wherein said member has at least one textured surface, whereby said textured surface is applied by a press.

B1 45. The member of Claim 44, wherein said member is a tie having at least one textured surface with indentations at least 1/8" deep.

46. The member of Claim 44, wherein said member is a tie having a textured surface with indentations that provide surfaces perpendicular to the longitudinal axis of the tie.

47. The member of Claim 44, wherein said member is a tie having a textured surface with indentations at least 1/4" wide, but less than 6" wide.

48. The member of Claim 44, wherein said member is a tie having a textured surface and wherein the pattern provides corners or holes to capture and hold individual pieces of ballast.

49. The member of Claim 47, wherein said member is a tie having a textured surface and wherein said indentations provide resistance to force across at least 10% of said tie surface.

50. The composite of Claim 14, wherein a Banbury mixer or other open chamber mixer is used to mix said composite.

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51-67. (Cancelled)

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